

# Safety Data Sheet Boric Acid

## SECTION 1. Identification

### 1.1. Product identifier

**Boric Acid**

**Index No** 005-007-00-2

**CAS** 10043-35-3

**ECN** 233-139-2

**REACH Registration number:** 01-2119486683-25-0006

**Trade names:** Boric Acid

**Chemical name/synonyms:** Orthoboric acid, boric acid

### 1.2. Details of the supplier of the safety data sheet

**Supplier name:** Blue Ridge Elements, LLC

**Address:** 3730 Old Tasso Rd NE, Cleveland, TN 37312

**Phone No:** (423)693-0803

**1.3. Emergency Phone Numbers:** CHEMTREC 1-800-424-9300

### 1.4. Recommended use of the chemical and restrictions on uses advised

**against** The product is used in industrial manufacturing, particularly in:

Ceramics

Cosmetics

Detergent

Borosilicate glass

Textile fiberglass

There is no restriction on use of chemical.

## SECTION 2. Hazard Identification

### 2.1. Classification of the substance

#### GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Reproductive toxicity (Category 2) H361 Suspected of damaging fertility or the unborn child

### 2.2 GHS Label elements

**Pictogram**

**Signal word**

Warning



## **Hazard statements**

**H361** Suspected of damaging fertility or the unborn child.

## **Precautionary statements**

**P201** Obtain special instructions before use.

**P202** Do not handle until all safety precautions have been read and understood.

**P281** Use personal protective equipment as required.

**P308/P313** If exposed or concerned: Get medical advice/ attention.

**P405** Store locked up.

**P501** Dispose of contents/ container to an approved waste disposal plant.

For Full text of R-S phrases as well as Hazard Class/Statements and Precautionary Statements see section 16.

## **Emergency overview**

Boric acid is a white odorless, powdered substance that is not flammable, combustible, or explosive, and has low acute oral and dermal toxicity.

## **Potential health effects**

Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because boric acid is poorly absorbed through intact skin.

### **Inhalation**

Occasional mild irritation effects to nose and throat may occur from inhalation of boric acid dusts at levels higher than 10 mg/m<sup>3</sup>.

### **Eye contact**

Boric acid is non-irritating to eyes in normal industrial use.

### **Skin contact**

Boric acid does not cause irritation to intact skin.

### **Ingestion**

Products containing boric acid are not intended for ingestion. Boric acid has a low acute toxicity. Small amounts (e.g., a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.

### **Reproductive/developmental**

Animal ingestion studies in several species, at high doses, indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction. A recent epidemiological study and a peer reviewing report of the past epidemiological studies conducted in China didn't show any negative effect of boron on human fertility (10, 11).

### **Potential ecological effects**

Large amounts of boric acid can be harmful to plants and other species. Therefore, releases to the environment should be minimized.

### **Signs and symptoms of exposure**

Symptoms of accidental over-exposure to boric acid have been associated with ingestion or absorption through large areas of damaged skin. These may include nausea, vomiting and diarrhea, with delayed effects of skin redness and peeling.

Refer to section 11 for details on Toxicological data.

## SECTION 3. Composition/ Information on Ingredients

### 3.1. Substances:

The product contains greater than 99.9 percent (%) boric acid.

Formula                     $H_3BO_3$   
Molecular Weight        61.84 g/mole

| Chemical Name | Purity | CAS        | ECN       | REACH Registration No. | Hazard Statement |
|---------------|--------|------------|-----------|------------------------|------------------|
| Boric acid    | 99.9%  | 10043-35-3 | 233-139-2 | 01-2119486683-25-0006  | H361             |

## SECTION 4. First-aid Measures

### 4.1. Description of first aid measures

#### General advice

Move out of dangerous area. Seek medical attention. Show this safety data sheet to the doctor in attendance.

#### Skin contact

Wash with soap and water. Seek medical attention.

#### Eye contact

As with any chemical exposure to the eye, flush eyes with water for at least 20 minutes. Seek medical attention.

#### Inhalation

If symptoms such as nose or throat irritation are observed, remove person to fresh air. If not breathing, give artificial respiration. Seek medical attention.

#### Ingestion

If large amounts are swallowed (i.e. more than one teaspoon), give two glasses of water or milk to drink and seek medical attention. Never give anything by mouth to an unconscious person.

#### Note to physicians

Observation only is required for adult ingestion of less than 6 grams of boric acid. For ingestion in excess of 6 grams, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment (1) (see section 11).

### 4.2. Most important symptoms and effects, both acute and delayed

Described in labelling.

### 4.3. Indication of any immediate medical attention and special treatment needed.

No data available.

## SECTION 5. Fire-fighting Measures Identification

### 5.1. Suitable extinguishing media

Use fire extinguishing media suitable for surrounding fires.

### 5.2. Specific hazards arising from the chemical

None, boric acid is non-flammable, combustible or explosive. The product is itself a flame retardant.

### 5.3. Special protective actions for fire-fighters

Firefighters should wear pressure demand, self-contained breathing apparatus and full turn-out gear.

## SECTION 6. Accidental Release Measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing dust. In case of exposure to prolonged or high level of airborne dust, wear a personal respirator in compliance with national legislation.

### 6.2. Environmental precautions

Boric acid is a water-soluble white powder that may, at high concentrations cause damage to trees or vegetation by root absorption (see section 12). Do not flush to drains.

### 6.3. Methods and materials for containment and cleaning up

#### Land spill

Vacuum, shovel or sweep up boric acid and place in containers for disposal in accordance with applicable local, state, and federal laws and regulations. Avoid contamination of water bodies during clean up and disposal. Avoid breathing dust.

#### Spillage into water

Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until natural dilution returns the boron value to its normal environmental background level (see sections 12, 13 and 15).

### 6.4. Reference to other sections

See sections 8 and 13 for further information.

## SECTION 7. Handling and Storage

### 7.1. Precautions for safe handling

To maintain package integrity and to minimize caking of the product, bags should be handled on a first-in first out basis. Good housekeeping and dust prevention procedures should be followed to minimize dust generation and accumulation. Use with appropriate local exhaust ventilation. The product should be kept away from strong reducing agents. Apply above handling advice when mixing with other substances.

### 7.2. Conditions for safe storage

Keep containers closed and store indoors in a dry well ventilated location. Provide appropriate ventilation and store bags such as to prevent any accidental damage.

### 7.3. Specific end use

See section 1.4.

## SECTION 8. Exposure Controls/Personal Protection

### 8.1. Control parameters

Occupational exposure limits for dust (total and respirable) are treated by OSHA, Cal OSHA and ACGIH as "Particulate Not Otherwise Classified" or "Nuisance Dust".

Respect regulatory provisions for dust (total and respirable).

|                       |                      |
|-----------------------|----------------------|
| ACGIH/TLV             | 10 mg/m <sup>3</sup> |
| Cal OSHA/PEL          | 10 mg/m <sup>3</sup> |
| OSHA/PEL (total dust) | 15 mg/m <sup>3</sup> |

OSHA/PEL (respirable dust) 5 mg/m<sup>3</sup>

### **DNEL values**

| Exposure pattern                    | Type/site of effect | Exposure route    | DNEL value                |
|-------------------------------------|---------------------|-------------------|---------------------------|
| <b>DNELs for workers</b>            |                     |                   |                           |
| Long-term                           | Systemic            | Inhalation        | 8.3 mg BA/m <sup>3</sup>  |
| Long-term                           | Systemic            | Dermal            | 3924800 mg BA/day         |
| <b>DNELs for the general public</b> |                     |                   |                           |
| Acute                               | Systemic            | Oral              | 0.98 mg BA/kg bw/day      |
| Long-term                           | Systemic            | Dermal (external) | 196 mg BA/kg bw/day       |
| Long-term                           | Systemic            | Dermal (systemic) | 0.98 mg BA/kg bw/day      |
| Long-term                           | Systemic            | Inhalation        | 4.15 mg BA/m <sup>3</sup> |
| Long-term                           | Systemic            | Oral              | 0.98 mg BA/kg bw/day      |

Source: Chemical Safety Report of Boric Acid

### **PNEC values**

**PNEC**<sub>add, freshwater, marine water</sub> = 1.35 mg B/L

**PNEC**<sub>add aqua intermittent</sub> = 9.1 mg B/L

**PNEC**<sub>add freshwater sediment, marine water sediment</sub> = 1.8 mg B/kg sediment dry weight

**PNEC**<sub>add, STP</sub> = 1.75 mg B/L

Source: Chemical Safety Report of Boric Acid

## **8.2. Exposure controls**

### **8.2.1. Appropriate engineering controls**

Maintain air concentrations below occupational exposure standards.

Use local exhaust ventilation to keep airborne concentrations of boric acid dust below permissible exposure levels. Wash hands before breaks and at the end of the workday. Remove and wash soiled clothing.

### **8.2.2. Individual protection measures, such as personal protective equipment**

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

#### Eyes and hand protection

Handle with gloves. Wear eye protection suitable for job tasks.

### **8.2.3. Environmental exposure controls**

No special requirement.

## SECTION 9. Physical and Chemical Properties

### **9.1. Information on basic physical and chemical properties**

|                  |                             |
|------------------|-----------------------------|
| Physical state   | powder or crystalline solid |
| Color            | white                       |
| Odor             | odorless                    |
| Odor threshold   | no data available           |
| Molecular weight | 61.83 g/mol                 |
| Specific gravity | 1.51 gr/cm <sup>3</sup>     |

|  |          |   |
|--|----------|---|
| pH @ 20°C                                    |          | 6.1 (0.1% solution)<br>5.1 (1.0% solution)<br>3.7 (4.7% solution) |
| Melting point                                |          | 169 ± 1°C (heated in closed space)                                |
| Initial boiling point and boiling range      |          | 300 °C (full dehydration)   |
| Flash point                                  |          | Not applicable  |
| Evaporation rate                             |          | Not applicable  |
| Flammability (solid, gas)                    |          | Not flammable   |
| Upper/lower flammability or explosive limits |          | Not applicable  |
| Vapor pressure                               |          | Negligible @ 20°C   |
| Vapor density                                |          | No data available   |
| Relative density                             |          | 1.49 gr/cm <sup>3</sup> @ 23°C                                    |
| Solubility in water                          |          | 4.7% @ 20°C; 27.5% @ 100°C  |
| Partition coefficient: n-octanol/water       |          | Log Kow (Pow): -1.09 @ 22°C                                       |
| Auto-ignition temperature                    |          | Not applicable  |
| Decomposition temperature                    |          | No data available   |
| Viscosity                                    |          | No data available   |
| Explosion hazard                             |          | Non explosive   |
| Oxidizing properties                         |          | No data available   |
| Bulk density:                                | Granular | 49.94 lbs/ft <sup>3</sup> (0.80 ton/m <sup>3</sup> )              |
|  | Powder   | 37.46 lbs/ft <sup>3</sup> (0.60 ton/m <sup>3</sup> )              |

## SECTION 10. Stability and Reactivity

### 10.1. Reactivity

No data available

### 10.2. Chemical stability

Boric acid is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. When heated it loses water, first forming metaboric acid (HBO<sub>2</sub>), and on further heating it is converted into boric oxide (B<sub>2</sub>O<sub>3</sub>).

### 10.3. Possibility of hazardous reactions

Reaction with strong reducing agents such as metal hydrides or alkali metals will generate flammable hydrogen gas which could create an explosive hazard.

### 10.4. Conditions to avoid:

Exposure to moisture and incompatible materials.

### 10.5. Incompatible materials

Boric acid reacts as a weak acid which may cause corrosion of base metals. Avoid contact with strong reducing agents such as metal hydrides or alkali metals.

### 10.6. Hazardous decomposition products

Boranes, hydrogen, boron oxides.

## SECTION 11. Toxicological Information

### 11.1. Information on toxicological effect

#### 11.1.1. Substances

##### Acute toxicity

Low acute oral toxicity; LD<sub>50</sub> in rats is 3,500 to 4,100 mg/kg of body weight.

### **Skin corrosion / irritation**

Low acute dermal toxicity; LD<sub>50</sub> in rabbits is greater than 2,000 mg/kg of body weight. Boric acid is poorly absorbed through intact skin. Non-irritating.

### **Serious eye damage/ irritation**

Non-irritating

### **Respiratory or skin sensitization:**

Boric acid is not a skin sensitizer.

### **Germ cell mutagenicity / carcinogenicity**

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

### **Reproductive toxicity**

Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes (2). Studies in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus including fetal weight loss and minor skeletal variations. The doses administered were many times in excess of those which humans would normally be exposed to (3, 4, 5). Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility.

### **STOT-single exposure**

N.A.

### **STOT-repeated exposure**

N.A.

### **Aspiration hazard**

Low acute inhalation toxicity; LC<sub>50</sub> in rats is greater than 2.0 mg/l (or g/m<sup>3</sup>).

## SECTION 12. Ecological Information

Boron occurs naturally in sea water at an average concentration of 5 mg B/l and fresh water at 1 mg B/l or less. In dilute aqueous solutions the predominant boron species present is un-dissociated boric acid. To convert boric acid into equivalent boron (B) content, multiply by 0.1748. Not persistent, not bio-accumulative.

### **12.1. Toxicity**

#### **Phytotoxicity**

Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimize the amount of borate product released to the environment.

#### **Algal toxicity (6)**

Green algae, *Pseudokirchneriella subcapitata* (Hansveit and Oldersma, 2000)

72-hr EC50 –biomass = 40 mg B/L, or 229 mg boric acid/L.

#### **Invertebrate toxicity (7)**

Daphnia, Daphnids, *Daphnia magna* (Gersich, 1984a)

48-hr LC50 = 133 mg B/L or 760 mg boric acid/L or 619 mg disodium tetraborate, anhydrous/L

#### **Fish toxicity (8)**

Fish, Fathead minnow, *Pimephales promelas* (Soucek et al., 2010)

96-hr LC50 = 79.7 mg B/L or 456 mg boric acid/L or 370 mg disodium tetraborate, anhydrous

### **12.2. Persistence and degradability**

Boron is naturally occurring and ubiquitous in the environment. Boric acid decomposes in the environment to natural borate.

### 12.3. Bio-accumulative potential

Not significantly bio-accumulative.

### 12.4. Mobility in soil

The product is soluble in water and is leachable through normal soil.

### 12.5. Results of PBT and vPvB assessment

No data available

### 12.6. Other adverse effects

No data available

## SECTION 13. Disposal Considerations

### 13.1. Disposal methods

Do not contaminate water, food, or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Non-refillable bag! Completely empty bag into application equipment. Offer for recycling, if available; otherwise dispose of empty bag in a sanitary landfill or by incineration, or if allowed by state and local authorities, by burning. If burning stay out of smoke.

## SECTION 14. Transport Information

Boric acid has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

#### US DOT

Not dangerous goods

#### IMDG

Not dangerous goods

#### IATA

Not dangerous goods

## SECTION 15. Regulatory Information

### 15.1. Safety, health and environmental regulations/substance specific legislation

It should be noted that borates are safe under conditions of normal handling and use, besides, they are essential nutrients to plants, and research shows that they play a beneficial role in human health.

#### Chemical inventory listing

U.S. EPA TSCA Inventory 10043-35-3

Canadian DSL 10043-35-3

ECN 233-139-2

South Korea 1-439

Japanese MITI (1)-63

Ensure all national/local regulations are observed.

SARA 302 No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards: Chronic Health Hazard

Massachusetts Right to Know Components

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right to Know Components**

Boric acid CAS-No. 10043-35-3 Revision Date 2009-07-17

**New Jersey Right To Know Components**

Boric acid CAS-No. 10043-35-3 Revision Date 2009-07-17

**California Prop. 65 Components**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**Clean Air Act (Montreal Protocol)**

Boric acid was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

**Cosmetics**

The EC Directive 76/768/EEC sets an upper limit of 5% boric acid in talc, 0.5% in oral hygiene products and 3% in other products. In addition, the talc should not be used on children under 3 years of age.

**EU Reach Regulation**

Boric acid is listed in the Candidate List of Substances of Very High Concern "SVHC" for eventual inclusion in Annex XIV to REACH Regulation 1907/2006 ("Authorization List"). (18.06.2010-ED/30/2010).

Boric acid is listed in the Annex XVII of REACH Regulation 1907/2006 (EU No.109/2012) and its use in consumer products above specific concentration limits is restricted. Note that this restriction is only specific to consumer products and do not cover its industrial and/or professional applications. Boric acid can be used in consumer products below specific concentration limits (which is C ≥5.5% for Boric Acid).

## SECTION 16. Other Information

**Full text of H-Statements referred to under sections 2 and 3.**

**H361** Suspected of damaging fertility or the unborn child

### References

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2. Weir R J, Fisher R S, Toxicol. Appl. Pharmacol., (1972), 23, 351-364
3. National Toxicology Program (NTP) – Technical Report Series No. TR324, NIH Publication No. 88-2580 (1987), PB88 213475/XAB
4. Fail *et al.*, Fund. Appl. Toxicol. (1991) 17, 225-239
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6. Hansveit and Oldersma, 2000; TNO Nutrition and Food Research Institute. Report No. V99.157.
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8. Soucek *et al.*, 2010. Illinois Natural History Survey, University of Illinois.
9. Birge W J, Black J A, EPA-560/-76-008 (April 1977) PB 267 085
10. Scialli AR, Bonde JP, Brüske-Hohlfeld I, Culver D, Li Y, Sullivan FM; ELSEVIER 2009
11. Robbins WA, Xun L, Jia J, Kennedy N, Elashoff DA, Ping L. ;ELSEVIER 2009;(Reproductive Toxicology)

For general information on the toxicology of borates see ECETOC Technical Report No. 63 (1995); Patty's Industrial

Hygiene and Toxicology, 4th Edition Vol. II, (1994) Chap. 42, Boron.

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